



#7

1

SEQUENCE LISTING

<110> Adler, David A.
Holloway, James L.
Baindur, Nand
Beigel-Orme, Stephanie
Sheppard, Paul O.

<120> NOVEL BETA-DEFENSINS

<130> 97-44D1

<140> US 10/091,166

<141> 2002-03-05

<150> US 09/636,399

<151> 2000-08-10

<150> US 09/344,097

<151> 1999-06-25

<150> US 09/150,786

<151> 1998-09-10

<150> US 60/064,294

<151> 1997-11-05

<150> US 60/058,335

<151> 1997-09-10

<160> 72

<170> FastSEQ for windows Version 4.0

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<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)...(195)

<400> 1

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| atg | agg | atc | cat | tat | ctt | ctg | ttt | gct | ttg | ctc | ttc | ctg | ttt | ttg | gtg | 48 |
| Met | Arg | Ile | His | Tyr | Leu | Leu | Phe | Ala | Leu | Leu | Phe | Leu | Phe | Leu | Val | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| cct | gtt | cca | ggt | cat | gga | gga | atc | ata | aac | aca | tta | cag | aaa | tat | tat | 96 |
| Pro | Val | Pro | Gly | His | Gly | Gly | Ile | Ile | Asn | Thr | Leu | Gln | Lys | Tyr | Tyr | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| tgc | aga | gtc | aga | ggc | ggc | cgg | tgt | gct | gtg | ctc | agc | tgc | ctt | cca | aag | 144 |
| Cys | Arg | Val | Arg | Gly | Gly | Arg | Cys | Ala | Val | Leu | Ser | Cys | Leu | Pro | Lys | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gag | gaa | cag | atc | ggc | aag | tgc | tcg | acg | cgt | ggc | cga | aaa | tgc | tgc | cga | 192 |
| Glu | Glu | Gln | Ile | Gly | Lys | Cys | Ser | Thr | Arg | Gly | Arg | Lys | Cys | Cys | Arg | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |

| | | | | |
|-----|------------|------------|------|-----|
| aga | aagaaataaa | aaccctgaaa | catg | 219 |
| Arg | | | | |
| 65 | | | | |

<210> 2

<211> 65

<212> PRT
 <213> Homo sapiens

<400> 2
 Met Arg Ile His Tyr Leu Leu Phe Ala Leu Leu Phe Leu Phe Leu Val
 1 5 10 15
 Pro Val Pro Gly His Gly Gly Ile Ile Asn Thr Leu Gln Lys Tyr Tyr
 20 25 30
 Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys
 35 40 45
 Glu Glu Gln Ile Gly Lys Cys Ser Thr Arg Gly Arg Lys Cys Cys Arg
 50 55 60
 Arg
 65

<210> 3
 <211> 31
 <212> PRT
 <213> Artificial Sequence

<220>
 <221> VARIANT
 <222> (2)...(7)
 <223> Any amino acid, preferably not cysteine.

<221> VARIANT
 <222> (9)...(12)
 <223> Any amino acid, preferably not cysteine.

<221> VARIANT
 <222> (14)...(20)
 <223> Any amino acid, preferably not cysteine.

<221> VARIANT
 <222> (22)...(22)
 <223> Any amino acid, preferably not cysteine.

<221> VARIANT
 <222> (24)...(29)
 <223> Any amino acid, preferably not cysteine.

<223> conserved motif

<400> 3
 Cys Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa Xaa Xaa Cys Xaa Xaa Xaa
 1 5 10 15
 Xaa Xaa Xaa Xaa Gly Xaa Cys Xaa Xaa Xaa Xaa Xaa Cys Cys
 20 25 30

<210> 4
 <211> 213
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Degenerate nucleotide encoding the polypeptide of
 SEQ ID NO:2.

<221> misc_feature
 <222> (1)...(213)
 <223> n = a, g, c or t

<400> 4
 athcaytay tnytnnttygc nytnytnntt ytnnttytng tncngtncc nggncaygg 60
 ggnathatha ayacnytnca raartrrrnn tgymngntnm gngngngnm ntgygcngtn 120
 ytnwsntgy tncnaarga rgarcarath ggnaartgyw snacnmngg nmgnartgy 180
 tgymngmna araartrraa rccntrraay atg 213

<210> 5
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide ZC14741

<400> 5
 gagcacttgc cgatctgttc 20

<210> 6
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide ZC14740

<400> 6
 ccaggtcatg gaggaatcat 20

<210> 7
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide ZC14780

<400> 7
 ggaggaatca taaacaca 18

<210> 8
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide ZC14776

<400> 8
 gccgatctgt tcctcctt 18

<210> 9
 <211> 438
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (220)...(420)

<400> 9
 acaaatccat agggagctct gccttaccat tgggttccta attaaactgag tgagtgggtg 60
 tgttctgcat ggtgagaggc attggaatga tgcatacagaa aacatgtcat aatgtcatca 120
 ctgtaatatg acaagaattg cagctgtggc tggaaccitt ataaagtgc caagcacacc 180
 ttttcatcca gtctcagcgt ggggtgaagc ctagcagct atg agg atc cat tat 234
 Met Arg Ile His Tyr
 1 5
 ctt ctg ttt gct ttg ctc ttc ctg ttt ttg gtg cct gtt cca ggt cat 282
 Leu Leu Phe Ala Leu Leu Phe Leu Phe Leu Val Pro Val Pro Gly His
 10 15 20
 gga gga atc ata aac aca tta cag aaa tat tat tgc aga gtc aga ggc 330
 Gly Gly Ile Ile Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Gly
 25 30 35

ggc cgg tgt gct gtg ctc agc tgc ctt cca aag gag gaa cag atc ggc 378
 Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Gly
 40 45 50

aag tgc tcg acg cgt ggc cga aaa tgc tgc cga aga aag aaa 420
 Lys Cys Ser Thr Arg Gly Arg Lys Cys Cys Arg Arg Lys Lys
 55 60 65

taaaaaccct gaaacatg 438

<210> 10
 <211> 67
 <212> PRT
 <213> Homo sapiens

<400> 10
 Met Arg Ile His Tyr Leu Leu Phe Ala Leu Leu Phe Leu Phe Leu Val
 1 5 10 15
 Pro Val Pro Gly His Gly Gly Ile Ile Asn Thr Leu Gln Lys Tyr Tyr
 20 25 30
 Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys
 35 40 45
 Glu Glu Gln Ile Gly Lys Cys Ser Thr Arg Gly Arg Lys Cys Cys Arg
 50 55 60
 Arg Lys Lys
 65

<210> 11
 <211> 219
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Degenerate nucleotide sequence encoding the
 polypeptide of SEQ ID NO:10.

<221> misc_feature
 <222> (1)...(219)
 <223> n = a, g, c or t

<400> 11
 atgmgnathc aytayytnyt nttygcnytn ytnttyytnt tyytngtncc ngtnccnggn 60
 cayggnggna thathaayac nytncaraar trrnnttgym gngtnmgngg nggnmgntgy 120
 gcngtnytnw sntgyytnc naargargar carathggna artgywsnac nmngngnmgm 180
 aartgytgym gnmghaaraa rtrraarccn trraayatg 219

<210> 12
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide ZC15591

<400> 12
 tgccgatctg ttcctccttt g 21

<210> 13
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide ZC15589

<400> 13
 gaacaggcac caaaaacagg aagag 25

<210> 14
 <211> 37
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 14
 Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala Val Leu Ser
 1 5 10 15
 Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr Arg Tyr Arg
 20 25 30
 Lys Cys Cys Arg Arg
 35

<210> 15
 <211> 29
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (26)...(26)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 15
 Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly
 1 5 10 15
 Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
 20 25

<210> 16
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (26)...(26)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 16
 Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly
 1 5 10 15
 Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys Lys
 20 25 30

<210> 17
 <211> 27
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (26)...(26)
 <223> leucine, isoleucine, valine, phenylalanine, or

methionine

<400> 17
 Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly
 1 5 10 15
 Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg
 20 25

<210> 18
 <211> 38
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 18
 Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala Val Leu Ser
 1 5 10 15
 Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr Arg Tyr Arg
 20 25 30
 Lys Cys Cys Arg Arg Lys
 35

<210> 19
 <211> 39
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 19
 Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala Val Leu Ser
 1 5 10 15
 Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr Arg Tyr Arg
 20 25 30
 Lys Cys Cys Arg Arg Lys Lys
 35

<210> 20
 <211> 44
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 20
 Ile Ile Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg
 1 5 10 15
 Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys
 20 25 30
 Ser Thr Arg Tyr Arg Lys Cys Cys Arg Arg Lys Lys
 35 40

<210> 21
 <211> 43
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 21

Ile Ile Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg
 1 5 10 15
 Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys
 20 25 30
 Ser Thr Arg Tyr Arg Lys Cys Cys Arg Arg Lys
 35 40

<210> 22
 <211> 42
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 22
 Ile Ile Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg
 1 5 10 15
 Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys
 20 25 30
 Ser Thr Arg Tyr Arg Lys Cys Cys Arg Arg
 35 40

<210> 23
 <211> 43
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 23
 Ile Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys
 1 5 10 15
 Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser
 20 25 30
 Thr Arg Tyr Arg Lys Cys Cys Arg Arg Lys Lys
 35 40

<210> 24
 <211> 42
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 24
 Ile Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys
 1 5 10 15
 Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser
 20 25 30
 Thr Arg Tyr Arg Lys Cys Cys Arg Arg Lys
 35 40

<210> 25
 <211> 41
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 25
 Ile Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys

1 5 10 8 15
 Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser
 20 25 30
 Thr Arg Tyr Arg Lys Cys Cys Arg Arg
 35 40

<210> 26
 <211> 42
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 26
 Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala
 1 5 10 15
 Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr
 20 25 30
 Arg Tyr Arg Lys Cys Cys Arg Arg Lys Lys
 35 40

<210> 27
 <211> 41
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 27
 Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala
 1 5 10 15
 Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr
 20 25 30
 Arg Tyr Arg Lys Cys Cys Arg Arg Lys
 35 40

<210> 28
 <211> 40
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 28
 Asn Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala
 1 5 10 15
 Val Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr
 20 25 30
 Arg Tyr Arg Lys Cys Cys Arg Arg
 35 40

<210> 29
 <211> 41
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 29
 Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala Val
 1 5 10 15

Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr Arg
 20 25 30
 Tyr Arg Lys Cys Cys Arg Arg Lys Lys
 35 40

<210> 30
 <211> 40
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 30
 Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala Val
 1 5 10 15
 Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr Arg
 20 25 30
 Tyr Arg Lys Cys Cys Arg Arg Lys
 35 40

<210> 31
 <211> 39
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 31
 Thr Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala Val
 1 5 10 15
 Leu Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr Arg
 20 25 30
 Tyr Arg Lys Cys Cys Arg Arg
 35

<210> 32
 <211> 40
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 32
 Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala Val Leu
 1 5 10 15
 Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr Arg Tyr
 20 25 30
 Arg Lys Cys Cys Arg Arg Lys Lys
 35 40

<210> 33
 <211> 39
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 33
 Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala Val Leu
 1 5 10 15
 Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr Arg Tyr

Arg Lys Cys 20 Cys Arg Arg Lys 25 10 30
 35

<210> 34
 <211> 38
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<400> 34
 Leu Gln Lys Tyr Tyr Cys Arg Val Arg Tyr Tyr Arg Cys Ala Val Leu
 1 5 10 15
 Ser Cys Leu Pro Lys Glu Glu Gln Ile Tyr Lys Cys Ser Thr Arg Tyr
 20 25 30
 Arg Lys Cys Cys Arg Arg
 35

<210> 35
 <211> 49
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (45)...(45)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 35
 Pro Gly His Gly Gly Ile Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg
 1 5 10 15
 Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu
 20 25 30
 Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
 35 40 45
 Lys

<210> 36
 <211> 48
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (45)...(45)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 36
 Pro Gly His Gly Gly Ile Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg
 1 5 10 15
 Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu
 20 25 30
 Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
 35 40 45

<210> 37

<211> 48
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (44)...(44)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 37
 Gly His Gly Gly Ile Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val
 1 5 10 15
 Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys
 20 25 30
 Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys Lys
 35 40 45

<210> 38
 <211> 47
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (44)...(44)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 38
 Gly His Gly Gly Ile Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val
 1 5 10 15
 Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys
 20 25 30
 Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
 35 40 45

<210> 39
 <211> 47
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (43)...(43)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 39
 His Gly Gly Ile Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg
 1 5 10 15
 Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile
 20 25 30
 Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys Lys
 35 40 45

<210> 40
 <211> 46
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Defensin polypeptide

<221> VARIANT

<222> (43)...(43)

<223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 40

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| His | Gly | Gly | Ile | Ile | Asn | Thr | Leu | Gln | Leu | Tyr | Tyr | Cys | Arg | Val | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Gly | Arg | Cys | Ala | Val | Leu | Ser | Cys | Leu | Pro | Lys | Glu | Glu | Cys | Ile |
| | | 20 | | | | | | 25 | | | | 30 | | | |
| Gly | Lys | Met | Ser | Thr | Arg | Gly | Arg | Lys | Cys | Xaa | Arg | Arg | Lys | | |
| | 35 | | | | | 40 | | | | | 45 | | | | |

<210> 41

<211> 46

<212> PRT

<213> Artificial Sequence

<220>

<223> Defensin polypeptide

<221> VARIANT

<222> (42)...(42)

<223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 41

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Gly | Ile | Ile | Asn | Thr | Leu | Gln | Leu | Tyr | Tyr | Cys | Arg | Val | Arg | Gly |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Gly | Arg | Cys | Ala | Val | Leu | Ser | Cys | Leu | Pro | Lys | Glu | Glu | Cys | Ile | Gly |
| | | 20 | | | | | | 25 | | | | 30 | | | |
| Lys | Met | Ser | Thr | Arg | Gly | Arg | Lys | Cys | Xaa | Arg | Arg | Lys | Lys | | |
| | 35 | | | | | 40 | | | | | 45 | | | | |

<210> 42

<211> 45

<212> PRT

<213> Artificial Sequence

<220>

<223> Defensin polypeptide

<221> VARIANT

<222> (42)...(42)

<223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 42

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Gly | Ile | Ile | Asn | Thr | Leu | Gln | Leu | Tyr | Tyr | Cys | Arg | Val | Arg | Gly |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Gly | Arg | Cys | Ala | Val | Leu | Ser | Cys | Leu | Pro | Lys | Glu | Glu | Cys | Ile | Gly |
| | | 20 | | | | | | 25 | | | | 30 | | | |
| Lys | Met | Ser | Thr | Arg | Gly | Arg | Lys | Cys | Xaa | Arg | Arg | Lys | | | |
| | 35 | | | | | 40 | | | | | 45 | | | | |

<210> 43

<211> 45

<212> PRT

<213> Artificial Sequence

<220>

<223> Defensin polypeptide

<221> VARIANT
 <222> (41)...(41)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 43
 Gly Ile Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly
 1 5 10 15
 Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys
 20 25 30
 Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys Lys
 35 40 45

<210> 44
 <211> 44
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (41)...(41)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 44
 Gly Ile Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly
 1 5 10 15
 Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys
 20 25 30
 Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
 35 40

<210> 45
 <211> 44
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (40)...(40)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 45
 Ile Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg
 1 5 10 15
 Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met
 20 25 30
 Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys Lys
 35 40

<210> 46
 <211> 43
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (40)...(40)

14
<223> leucine, isoleucine, valine, phenylalanine, or
methionine

<400> 46
Ile Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg
1 5 10 15
Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met
20 25 30
Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
35 40

<210> 47
<211> 43
<212> PRT
<213> Artificial Sequence

<220>
<223> Defensin polypeptide

<221> VARIANT
<222> (39)...(39)
<223> leucine, isoleucine, valine, phenylalanine, or
methionine

<400> 47
Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys
1 5 10 15
Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser
20 25 30
Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys Lys
35 40

<210> 48
<211> 42
<212> PRT
<213> Artificial Sequence

<220>
<223> Defensin polypeptide

<221> VARIANT
<222> (39)...(39)
<223> leucine, isoleucine, valine, phenylalanine, or
methionine

<400> 48
Ile Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys
1 5 10 15
Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser
20 25 30
Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
35 40

<210> 49
<211> 42
<212> PRT
<213> Artificial Sequence

<220>
<223> Defensin polypeptide

<221> VARIANT
<222> (38)...(38)
<223> leucine, isoleucine, valine, phenylalanine, or
methionine

<400> 49
 Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala
 1 5 10 15
 Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr
 20 25 30
 Arg Gly Arg Lys Cys Xaa Arg Arg Lys Lys
 35 40

<210> 50
 <211> 41
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<220>
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<221> VARIANT
 <222> (38)...(38)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 50
 Asn Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala
 1 5 10 15
 Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr
 20 25 30
 Arg Gly Arg Lys Cys Xaa Arg Arg Lys
 35 40

<210> 51
 <211> 41
 <212> PRT
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<220>
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<221> VARIANT
 <222> (37)...(37)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 51
 Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val
 1 5 10 15
 Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg
 20 25 30
 Gly Arg Lys Cys Xaa Arg Arg Lys Lys
 35 40

<210> 52
 <211> 40
 <212> PRT
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<220>
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<221> VARIANT
 <222> (37)...(37)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 52
 Thr Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val
 1 5 10 15

Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg
 20 25 30
 Gly Arg Lys Cys Xaa Arg Arg Lys
 35 40

<210> 53
 <211> 40
 <212> PRT
 <213> Artificial Sequence

<220>
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<221> VARIANT
 <222> (36)...(36)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 53
 Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu
 1 5 10 15
 Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly
 20 25 30
 Arg Lys Cys Xaa Arg Arg Lys Lys
 35 40

<210> 54
 <211> 39
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (36)...(36)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 54
 Leu Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu
 1 5 10 15
 Ser Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly
 20 25 30
 Arg Lys Cys Xaa Arg Arg Lys
 35

<210> 55
 <211> 39
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<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (35)...(35)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 55
 Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser
 1 5 10 15
 Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg
 20 25 30
 Lys Cys Xaa Arg Arg Lys Lys

35

<210> 56
 <211> 38
 <212> PRT
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<220>
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<221> VARIANT
 <222> (35)...(35)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 56
 Gln Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser
 1 5 10 15
 Cys Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg
 20 25 30
 Lys Cys Xaa Arg Arg Lys
 35

<210> 57
 <211> 38
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (34)...(34)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 57
 Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys
 1 5 10 15
 Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys
 20 25 30
 Cys Xaa Arg Arg Lys Lys
 35

<210> 58
 <211> 37
 <212> PRT
 <213> Artificial Sequence

<220>
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<221> VARIANT
 <222> (34)...(34)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 58
 Leu Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys
 1 5 10 15
 Leu Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys
 20 25 30
 Cys Xaa Arg Arg Lys
 35

<210> 59
 <211> 37
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<220>
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<221> VARIANT
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 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 59
 Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu
 1 5 10 15
 Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys
 20 25 30
 Xaa Arg Arg Lys Lys
 35

<210> 60
 <211> 36
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<221> VARIANT
 <222> (33)...(33)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 60
 Tyr Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu
 1 5 10 15
 Pro Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys
 20 25 30
 Xaa Arg Arg Lys
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<210> 61
 <211> 36
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<221> VARIANT
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 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 61
 Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro
 1 5 10 15
 Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa
 20 25 30
 Arg Arg Lys Lys
 35

<210> 62
 <211> 35
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<221> VARIANT

<222> (32)...(32)

<223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 62

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Tyr Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro
 1      5      10      15
Lys Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa
 20      25      30
Arg Arg Lys
      35

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<210> 63

<211> 35

<212> PRT

<213> Artificial Sequence

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<223> Defensin polypeptide

<221> VARIANT

<222> (31)...(31)

<223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 63

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Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys
 1      5      10      15
Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg
 20      25      30
Arg Lys Lys
      35

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<210> 64

<211> 34

<212> PRT

<213> Artificial Sequence

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<223> Defensin polypeptide

<221> VARIANT

<222> (31)...(31)

<223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 64

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Cys Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys
 1      5      10      15
Glu Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg
 20      25      30
Arg Lys

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<210> 65

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> Defensin polypeptide

<221> VARIANT

<222> (30)...(30)

<223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 65

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Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu
 1         5         10        15
Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg
      20        25        30
Lys Lys

```

<210> 66

<211> 33

<212> PRT

<213> Artificial Sequence

<220>

<223> Defensin polypeptide

<221> VARIANT

<222> (30)...(30)

<223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 66

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Arg Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu
 1         5         10        15
Glu Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg
      20        25        30
Lys

```

<210> 67

<211> 33

<212> PRT

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<223> Defensin polypeptide

<221> VARIANT

<222> (29)...(29)

<223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 67

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Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu
 1         5         10        15
Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
      20        25        30
Lys

```

<210> 68

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> Defensin polypeptide

<221> VARIANT

<222> (29)...(29)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 68
 Val Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu
 1 5 10 15
 Cys Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
 20 25 30

<210> 69
 <211> 32
 <212> PRT
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<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (28)...(28)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 69
 Arg Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys
 1 5 10 15
 Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys Lys
 20 25 30

<210> 70
 <211> 31
 <212> PRT
 <213> Artificial Sequence

<220>
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<221> VARIANT
 <222> (28)...(28)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 70
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 1 5 10 15
 Ile Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
 20 25 30

<210> 71
 <211> 31
 <212> PRT
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<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (27)...(27)
 <223> leucine, isoleucine, valine, phenylalanine, or methionine

<400> 71
 Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile
 1 5 10 15
 Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys Lys
 20 25 30

<210> 72
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Defensin polypeptide

<221> VARIANT
 <222> (27)...(27)
 <223> leucine, isoleucine, valine, phenylalanine, or
 methionine

<400> 72
 Gly Gly Arg Cys Ala Val Leu Ser Cys Leu Pro Lys Glu Glu Cys Ile
 1 5 10 15
 Gly Lys Met Ser Thr Arg Gly Arg Lys Cys Xaa Arg Arg Lys
 20 25 30